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Remarks

Reconsideration of rejected claims 1-14 is respectfully requested.

In the Office action dated December 15, 2005, the Examiner rejected all pending claims under 35 USC §§ 102(e) and 103(a). The Examiner's specific rejections will be addressed below in the order appearing in the Office action.

35 USC § 102(e) Rejection - Claims 1-4, 6-8, 10 and 12-13

The Examiner first rejected the above-cited claims under 35 USC 102(e) as being "anticipated" by US Patent 6,532,115 (Holmes). With respect to independent claim 1, the Examiner cited Holmes as teaching "an active light .. source", "a passive receiver of light" and "a MEMS mirror ... electrically controlled (44) to change its deflection profile until alignment is achieved (col. 5, lines 49-51).".

In response, applicants assert that the Holmes reference cannot be found to "anticipate" the teachings of the present invention as defined by independent claims 1, 7 and 10, or any of the claims that depend therefrom. Applicants have amended various ones of the pending claims to clarify the subject matter of the present invention. However, it is not contemplated that any of these amendments are necessary to distinguish the teaching of the present invention from the cited Holmes reference.

Applicants first assert that Holmes is related to an "optical *switching* system", where one or more MEMS elements are used to switch a light beam from a first receiver to a second receiver (such as between fibers contained in "sources and targets 12". There is no discussion, suggestion or teaching in Holmes regarding *alignment* between a given light source and a given light receiver, where this is precisely the purpose of the present invention. As defined by independent claim 1, the "deflection profile" of a MEMS mirror is modified until such an alignment is achieved. In contrast, Holmes teachings the use of a MEMS mirror in its conventional setting of switching between a first receiver and a second receiver (see, for example, FIG. 6 of Holmes).

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The Examiner makes reference to element 44 of Holmes as teaching the “electronic control” of the deflection profile of a MEMS mirror (referred to as a “switch controller” 44 in Holmes). As defined in Holmes at column 5, beginning at line 48, “switch controller 44 is adapted to read the header. Switch controller 44 may be adapted, either alone or in coordination with other devices, to determine the destination of the light signal”. The Holmes reference goes on to describe the operation of switch controller 44 in column 6 as working with “at least one emitter in emitter array 56 to transmit an outgoing signal 28. The position of the emitter corresponds the position of the target of the signal”. Clearly, the operation of such a “switch controller” can easily be distinguished from the inventive description of modifying the “deflection profile” of a MEMS mirror to obtain alignment. Indeed, the phrase “deflection profile” cannot be found in the cited Holmes reference.

Regarding independent claim 7, the Examiner refers to FIG. 6 of Holmes as teaching the particular “arrangement for controlling the amount of optical power received at the input of a passive optical receiver”. Independent claim 7 has been amended to clarify the arrangement of the present invention, where a separate MEMS mirror is associated with each active optical device in a one-to-one relationship (see FIG. 3 of applicant’s disclosure). In contrast, the arrangement of Holmes as illustrated in FIG. 6 utilizes a pair of MEMS mirrors in sequence to re-direct a single beam from a single source fiber 304 to a single receive fiber 306. Independent claim 7 has further been amended to include the inventive aspect of controlling the “deflection profile” of each MEMS mirror to achieve optimum alignment.

Regarding independent claim 10, the Examiner refers again to FIG. 6 of Holmes, which teaches the use of a pair of MEMS devices. Again, applicants have amended independent claim 10 (in a manner similar to independent claim 7) to define the one-to-one relationship between the MEMS mirrors and the active optical devices. The specific embodiment of the present invention associated with independent claim 10 is illustrated in FIG. 4 (showing a separate passive receiver of light for each active light source). Clearly, there is no such arrangement disclosed or suggested in Holmes, with or without the also necessary teaching regarding the adjustment of the “deflection profile” of each MEMS mirror.

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Based on all of these various distinctions, applicants assert that Holmes cannot be found to “anticipate” the subject matter of the present invention in the manner required by 35 USC 102(e). Applicants thus respectfully request the Examiner to reconsider this rejection and find independent claims 1, 7 and 10, as well as associated dependent claims 2-4, 6, 8, and 12-13.

35 USC § 103(a) Rejection – Claims 5, 9 and 11

The Examiner next rejected claims 5, 9 and 11 under 35 USC 103(a) as being unpatentable over Holmes, as above, with the taking of Office Notice regarding the use of a specific type of optical device for a “transmitter” or “receiver”. Regardless of the Examiner’s assertions regarding “office notice”, applicants assert for all of the reasons given above that Holmes cannot be found to render obvious the teachings of the present invention. Applicants thus request the Examiner to also reconsider this rejection and find claims 5, 9 and 11 to be in condition for allowance.

35 USC § 103(a) Rejection - Claim 14

Lastly, the Examiner rejected independent claim 14 under 35 USC 103(a) as being unpatentable over Holmes (as above), in further view of US Patent 5,138,676 (Stowe et al. - also referred to as “Duncan” in the Examiner’s rejection). The Examiner cited Holmes as teaching the use of a “monitoring photodiode 42”; and a “control circuit 44”, the control circuit “responding to changes in optical power received by said alignment monitoring photodiode and generating alignment correction signals .. to modify the deflection profile of said first and second MEMOS mirrors”.

Applicants assert that such is not the case in the cited Holmes reference. The “detector 42” of Holmes is merely a receiver of the input light signal, where the output from the detector is fed to “switch controller 44”, as discussed above, to active particular ones of the receiving elements within array 56. There is no monitoring of the “power” of the received signal by detector 42, nor is there any use of “changes in optical power” to “modify the deflection profile” of the MEMS mirrors - this being a significant aspect of the present invention as defined by claim 14.

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Without this teaching, applicants assert that the combination of Holmes and Stowe et al. cannot be found to render obvious the attributes of independent claim 14. Applicants thus respectfully request the Examiner to reconsider this rejection and find claim 14 to be in condition for allowance.

In summary, the present application contains claims 1-14, where various ones of the claims have been amended to clarify the subject matter of the present invention. None of these amendments are considered as required to differentiate the teaching of the present invention from the cited Holmes reference, since Holmes does not anticipate, disclose or suggest any arrangement for modifying the "deflection profile" of a MEMS mirror to provide alignment between a given optical transmitter and its associated receiver.

Respectfully submitted,

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